

CLAIMS:

1. A computer readable medium for optical storage of data comprising,
an LC layer , including
a first type of liquid crystal molecules aligned in one direction and forming a
polymer network, and
5 a second type of liquid crystal molecules oriented in a second direction, in
which the orientation of said second type of liquid crystal molecules is meta-stable.
2. A computer readable medium, according to claim 1, in which the LC layer
contains 0,1 – 10% by weight of said first type of liquid crystal molecules, and 80 - 99,9% by
10 weight of said second type of liquid crystal molecules.
3. A computer readable medium according to claim 1, comprising several LC
layers.
- 15 4. A computer readable medium according to claim 3, in which at least one LC
layer is pre-written with data.
5. A computer readable medium according to claim 1, in which the LC layer
contains fluorescent dye molecules.
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6. Method for producing a computer readable medium for optical storage of data,
comprising the steps of:
applying, onto a substrate, a mixture comprising a first type of liquid crystal
molecules and a second type of liquid crystal molecules, said second type of liquid crystal
25 molecules being associated with a glass transition temperature, for providing a glassy LC
layer,
heating the liquid crystal layer to a temperature above the glass transition
temperature,
providing alignment of the liquid crystal molecules in a first direction,

supplying radiation to the LC layer in order to form a liquid crystal polymer network of the first type of liquid crystal molecules,

applying an electric or magnetic field to the LC layer causing orientation of the second type of liquid crystal molecules in a second direction, and

5 cooling the LC layer to a temperature below said glass transition temperature during the application of said electric or magnetic field, so that a meta-stable state of orientation of liquid crystal molecules is established in said medium.

7. Method for producing a computer readable medium for optical storage of data
10 according to claim 6, for which the mixture applied comprises fluorescent dye molecules.

8. Method for producing a computer readable medium, according to claim 6, for which said computer readable medium comprises several LC layers.

15 9. Method for producing a computer readable medium, according to claim 8, in which writing of data is performed in at least one layer.

10. Method for producing a computer readable medium, according to claim 9,
20 wherein more than one bit area is heated simultaneously by applying a pre-patterned hot stamp.

11. Method for producing a computer readable medium for optical storage of data according to claim 6, in which the step of providing alignment, includes application of an alignment layer onto said substrate prior to applying said mixture of liquid crystal molecules.

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12. Method for producing a computer readable medium for optical storage of data according to claim 6, in which the step of providing alignment, includes the usage of an external electric field applied to the LC layer.

30 13. Method for producing a computer readable medium for optical storage of data according to claim 6, in which the step of providing alignment, includes the usage of an external magnetic field applied to the LC layer.

14. Method for producing a computer readable medium for optical storage of data according to claim 6, in which the radiation supplied in order to form at least one liquid crystal polymer network, is electromagnetic radiation and one of UV-light, X-ray or gamma rays.

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15. Method according to claim 6, in which the radiation supplied is an electron beam radiation.

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16. Method according to claim 6, wherein the first type of liquid crystal molecules are reactive and the second type are non-reactive liquid crystal molecules.

17. Method according to claim 6, in which the step of heating includes heating to a temperature above the glass transition temperature, T_g , and below the clearing temperature, T_c .

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18. Method of writing data into a computer readable medium according to claim 1, comprising the following step,

for every bit area in a LC layer to be written,

20 applying a heat pulse to said bit area in the LC layer, such that the temperature, T , of said area becomes higher than the glass transition temperature, T_g , of the second type of LC molecules in said bit area.

19. Method of writing data according to claim 18, wherein the application of a heat pulse to the bit area is performed by focussing a short laser pulse in said bit area.